

Appl. No.: 10/661,850
Amdt. dated 01/03/2006
Reply to Office action of August 3, 2005

REMARKS/ARGUMENTS

Claims 1-13, 15, 17-19, and 21-23 are pending. Claims 5-8 and 17-18 are allowed, and Claims 9-12, 15, and 20-23 are indicated to be patentable in subject matter.

Claims 1-2 were rejected as anticipated by SU 848,914. Claims 1-3 were rejected as anticipated by U.S. Patent No. 4,472,107 to Chang. Claims 1-2 were rejected as unpatentable over EP 518,027 in view of U.S. Patent No. 4,253,031 to Frister. Claim 4 was rejected as unpatentable over EP '027 and Frister and further in view of U.S. Patent No. 1,998,784 to Mock. Claims 13-14 were rejected as unpatentable over SU 848,914 in view of U.S. Patent No. 5,816,784 to Postuchow. Claims 16 and 19 were rejected as unpatentable over EP '027 in view of U.S. Patent No. 6,478,469 to Jones.

Applicant appreciates the careful and thorough examination reflected in the Office Action. Applicant has amended the specification to address the objections set forth in the Office Action, and has amended the claims to address the claim objections in the Office Action and to distinguish over the cited references.

Claim 1 is directed to a compressor that is structured and arranged to compress a mixture of air and fuel fed into the compressor. As will be appreciated, when air and fuel are compressed in the compressor, unless positive steps are taken to prevent it, some fuel will leak into the bearing area of the compressor and from there can escape into the atmosphere. This is highly undesirable, given the stringent requirements often imposed on turbogenerators in terms of emissions of unburned hydrocarbons and the like. The invention of Claim 1 has as its object to prevent fuel from leaking into the bearing area. Toward this end, a sealing arrangement is provided to prevent fuel from leaking via the leakage pathway into the bearing casing and thereby escaping into the atmosphere. The sealing arrangement comprises a hydraulic resistance element disposed between a surface of the compressor wheel and a fixed wall of the compressor housing, and a pressurized air supply duct leading through the compressor housing into the leakage pathway at a location between the bearing casing and the hydraulic resistance element.

The leakage pathway includes a portion that extends from the hydraulic resistance element to the bearing casing and that is free of any further hydraulic resistance elements.

The sealing arrangement includes a source of pressurized air that is free of fuel and that has a pressure exceeding that in the main gas flow path. The source is arranged to feed the pressurized fuel-free air through the pressurized air supply duct into the compressor leakage pathway such that the pressurized fuel-free air prevents fuel from flowing from the main gas flow path past the hydraulic resistance element and into the bearing casing.

None of the cited references discloses the compressor of Claim 1. SU 848,914 discloses an air compressor in which a labyrinth seal 12 is disposed in a pathway that extends between the main gas flow path and the bearing casing 3. A pitot tube 21 is disposed in the compressor inlet for capturing inlet air, and the air is supplied via a duct 22 into a cavity 8 located between the labyrinth seal 12 and the bearing casing. The objective is to reduce axial forces on the compressor wheel. The pitot tube 21 and duct 22 are not capable of supplying air into the cavity 8 at a pressure greater than the impeller discharge air pressure, since the maximum pressure the pitot tube 21 could possibly attain is the stagnation pressure of the inlet air stream, which in general is substantially lower than the discharge pressure. Accordingly, some of the compressor discharge fluid will leak past the seal 12 into the cavity 8 and then into the bearing area 3. Thus, although SU 848,914 never mentions compressing a mixture of air and fuel, if it were so used, fuel would leak into the bearing casing and thus could escape to the atmosphere.

It is thus apparent that SU 848,914 does not anticipate or render obvious the compressor of Claim 1.

EP 518,027 discloses a centrifugal compressor in which a pair of labyrinth seals are arranged at a back side of the impeller, and cold air at a pressure exceeding that at the impeller exit is supplied through a duct 9 into a cavity 6 disposed between the two seals. The objective is to cool the back side of the impeller. EP 518,027 does not anticipate the compressor of Claim 1 because Claim 1 requires that the portion of the leakage pathway between the hydraulic resistance element (i.e., the radially outer one of the two seals in EP 518,027) and the bearing

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casing is free of any further hydraulic resistance elements. This is not true of EP 518,027, since it has the second labyrinth seal radially inward of the cavity 6 and duct 9. Nothing in EP 518,027 or the other cited references suggests eliminating the radially inner seal. Furthermore, EP 518,027 does not disclose or suggest compressing a mixture of air and fuel and providing a sealing arrangement to prevent fuel from leaking into the bearing casing.

Accordingly, it is respectfully submitted that amended Claim 1 is patentable over the cited references.

Independent Claim 13 was rejected as unpatentable over SU 848,914 in view of U.S. Patent No. 5,816,784 to Postuchow et al. Applicant has amended Claim 13 to include the pressurized air supply duct of Claim 14 and to further include a source of pressurized fuel-free air that is fed through the pressurized air supply duct into the leakage pathway. SU 848,914 does not include any such source of pressurized fuel-free air. If the compressor of SU 848,914 were used to compress a mixture of air and gaseous fuel, the fluid fed through the duct 9 into the leakage pathway would include fuel, since the fluid is drawn from the compressor flow path. Postuchow does not disclose any pressurized air supply duct or source of pressurized fuel-free air as claimed.

Thus, amended Claim 13 is not disclosed or suggested by SU 848,914 and Postuchow.

Finally, independent Claim 19 has been amended to include the feature of Claim 20, which was indicated to be allowable in subject matter. Accordingly, it is submitted that Claim 19 is in condition for allowance.

Conclusion

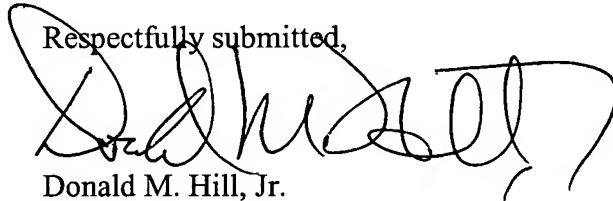
Based on the above amendments and remarks, it is respectfully submitted that all pending claims are patentable and the application is in condition for allowance.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper.

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However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefor (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,

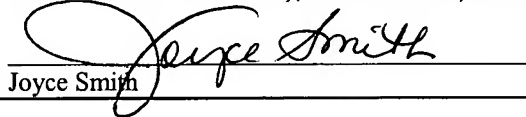


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CLT01/4778850v1